Commonwealth of Kentucky
Division for Air Quality

PERMIT APPLICATION SUMMARY FORM

Completed by: John Jump

GENERAL INFORMATION:

Name:	Catlettsburg Refining, L.L.C.
Address:	Catlettsburg, KY 41129
Date application received:	April 12, 2001
SIC/Source description:	2911/Petroleum Refining
EIS #:	21-019-00004
Application log number:	53771
Permit number:	VF-02-001

APPLICATION TYPE/PERMIT ACTIVITY:

[ ] Initial issuance
[X] Permit modification
__Administrative
__Minor
X Significant
[ ] Permit renewal

[ ] General permit
[ ] Conditional major
[X] Title V
[X] Synthetic minor
[ ] Operating
[X] Construction/operating

COMPLIANCE SUMMARY:

[ ] Source is out of compliance
[ ] Compliance certification signed
[ ] Compliance schedule included

APPLICABLE REQUIREMENTS LIST:

[ ] NSR
[X] SIP
[ ] NESHAPS
[X] NSPS
[ ] PSD
[ ] Other
[X] Netted out of PSD/NSR
[ ] Not major modification per 401 KAR 51:017, 1(23)(b) or 51:052,1(14)(b)

MISCELLANEOUS:

[ ] Acid rain source
[ ] Source subject to 112(r)
[X] Source applied for federally enforceable emissions cap
[X] Source provided terms for alternative operating scenarios
[X] Source subject to a MACT standard
[ ] Source requested case-by-case 112(g) or (j) determination
[ ] Application proposes new control technology
[X] Certified by responsible official
[X] Diagrams or drawings included
[ ] Confidential business information (CBI) submitted in application
[ ] Pollution Prevention Measures
[ ] Area is non-attainment (list pollutants):

EMISSIONS SUMMARY:

As described below, two emission units are added as part of this project, twenty-seven are modified or debottlenecked, and two are shut down. The total past actual emissions from the twenty-nine existing units and the future potential emissions from the twenty-nine future units are as follows:

Pollutant	Actual (tpy)	Potential (tpy)
PM	367	327
PM10	367	327
SO_2	4,525	789
NOx	1,724	791
CO	1,159	1,114
VOC	203	162

SOURCE PROCESS DESCRIPTION:

The site of the proposed project is the petroleum refinery operated by Catlettsburg Refining, LLC, a subsidiary of Marathon Ashland Petroleum LLC. This refinery is located on the Big Sandy River in Catlettsburg, Boyd County, Kentucky.

The proposed refinery modernization project involves installation of new equipment and upgrading of existing equipment. This will allow the refinery to produce cleaner-burning transportation fuels, to improve yields, to utilize a wider range of purchased feed materials, and to reduce fixed and operating costs. In addition, the project will substantially reduce emissions of sulfur dioxide and nitrogen oxides from the refining operations.

The only new process unit to be installed at the refinery is a Hydrogen Generation Unit (ID No. 2-122) with a nominal hydrogen production capacity of 30 million scf/day. The increased hydrogen supply is necessary for the increased hydrotreating capacity, which in turn is necessary for production of low-sulfur gasoline. The Hydrogen Generation Unit will include a fired Reformer Heater (ID No. 2-122-B-1) as well as a reformer vent that will emit primarily steam, along with trace quantities of methanol and ammonia.

In addition, one new storage vessel, Tank 920, will be installed. This tank will have a capacity of 150,000 barrels and will store gas oil (FCC feedstock).

The No. 2 Crude Unit (ID No. 1-2) will be modified to increase its nominal throughput capacity to 30,000 barrels per day. The existing heater within this unit (No. 2 Crude Charge Heater, ID No. 1-2-B-3) will not be modified.

The No. 3 Crude Unit (ID No. 2-23) will be modified to increase its crude slate flexibility, product recovery, and energy efficiency. The nominal capacity will be increased from 130,000 to 145,000 barrels per day. The heaters within this unit (No. 3 Crude Charge Heater #1, ID No. 2-23-B-3, and

No. 3 Crude Charge Heater #2, ID No. 2-23-B-4) will be modified to increase heat input capacity, improve efficiency, and reduce NO_X emissions.

The No. 4 Vacuum Unit (ID No. 2-26) will be modified to increase its product recovery and energy efficiency and to increase its nominal capacity from 38,000 to 75,000 barrels per day. The existing heater within this unit (No. 4 Vacuum Charge Heater, ID No. 2-26-B-2) will not be modified. The existing FCC Charge Heater (currently ID No. 2-1-B-8) will be switched to the No. 4 Vacuum Unit and will operate in parallel with the existing No. 4 Vacuum Charge Heater and renamed as the No. 4 Vacuum Charge Heater (ID No. 2-23-B-6). This heater will be modified to increase its heat input capacity and, in addition, it may be retrofitted with low-NO_X burners.

The existing Vacuum Gas Oil Hydrotreater (ID No. 2-104) will be modified to increase its nominal capacity from 40,000 to 60,000 barrels per day. This unit will be renamed the High-Pressure Vacuum Gas Oil (HPVGO) Hydrotreater. The heaters within this unit (HPVGO Charge Heater No. 1, ID No. 2-104-B-1, and HPVGO Charge Heater No. 2, ID No. 2-104-B-2) will not be modified, but will be retrofitted with low-NO_X burners.

The existing Kerosene Desulfurizer (ID No. 2-103) will be converted to a gas oil hydrotreater with a nominal capacity of 40,000 barrels per day. This unit will be renamed the Low-Pressure Vacuum Gas Oil (LPVGO) Hydrotreater. The two reactor charge heaters within this unit (LPVGO Charge Heater No. 1, ID No. 2-103-B-1 and LPVGO Charge Heater No. 2, ID No. 2-103-B-2) will not be modified. The LPVGO Stripper Heater (ID 2-103-B-3) will be converted from a stripper reboiler to a stripper charge heater.

The existing Residual Catalytic Cracking (RCC) Unit (ID No. 2-109) will be expanded and converted to a Fluidized Catalytic Cracking (FCC) Unit with a nominal gas oil charge capacity of 95,000 barrels per day. Four condensing turbine drivers and the associated air blowers and wet gas compressors will be replaced with a single electric motor-driven air blower and a single electric motor-driven wet gas compressor to improve process flexibility and energy efficiency. The FCC Unit catalyst regenerator also will be modified and expanded.

The heat recovery units (Unit ID Nos. 2-116-B-1 and 2-116-B-2) associated with the converted FCC Unit will be retrofitted with low-NO_X burners, and one of the two units will be retrofitted with a selective non-catalytic reduction (SNCR) system. At each of these units, the internal grid will be removed and the steam turbines serving the forced-draft fans will be replaced with electric motors. The existing limestone scrubber serving the heat recovery units will be eliminated, as deep hydrotreating of FCC Unit feedstock will eliminate the need for further SO_2 control. (Provisions will be made to add a de-SO_x catalyst additive, should it be required, in order to meet the SO_2 emission limit.)

The Gas Concentration Plant (Unit ID No. 2-110) associated with the converted FCC Unit (ID No. 2-109) will be upgraded and expanded, including extensive piping modifications. This unit does not include any fired heaters.

The existing Distillate Desulfurizer (ID No. 2-121) will be modified to increase its nominal capacity from 55,000 to 75,000 barrels per day. The heaters within this unit (DDS Reactor Charge Heater No. 1, ID No. 2-121-B-1; DDS Reactor Charge Heater No. 2, ID No. 2-121-B-2; and DDS Stripper Reboiler, ID No. 2-121-B-3) will not be modified.

The existing Sulfur Recovery Plant (ID Nos. 2-106 and 2-120) will be modified to improve reliability and efficiency and to increase nominal capacity from 400 long tons per day to 600 long tons per day.

The No. 2 Vacuum Unit (ID No. 1-2), including the associated charge heater (ID No. 1-2-B-1), will be permanently removed from service.

The existing Fluidized Catalytic Cracking Unit (ID No. 2-1), including the associated CO boiler (ID No. 2-601-B-9) and electrostatic precipitator, will be permanently removed from service. The current FCC Unit charge heater (ID No. 2-1-B-8) will be switched to the No. 4 Vacuum Unit and will be renamed as the No. 4 Vacuum Charge Heater (ID No. 2-23-B-6), as described above.

In conjunction with the shutdown of the existing FCC Unit, some equipment will be removed from the associated Gas Concentration Plant (ID No. 2-2), while other equipment will remain in service to operate in parallel with the existing RCC Gas Concentration Plant (Unit ID No. 2-110).

EMISSION AND OPERATING CAPS DESCRIPTION:

To preclude applicability of 401 KAR 51:017, Prevention of Significant Deterioration of Air Quality, and 401 KAR 51:052, Nonattainment New Source Review, Catlettsburg Refining has requested that the net emissions increases from the modification be limited to the following:

PM	- 41 tons per year (decrease)
PM10	- 41 tons per year (decrease)
SO_2	- 3,600 tons per year (decrease)
NO_X	- 945 tons per year (decrease)
CO	- 32 tons per year (decrease)
VOC	- 72 tons per year (decrease)

The net emissions decreases listed above are accomplished through netting analyses for each pollutant, in conjunction with emission limits on each of the 29 emission units that are modified or debottlenecked by this project. The total annual allowable emissions from these 29 emission units are as follows:

PM	327 tons per year
PM10	327 tons per year
SO_2	789 tons per year
NO_X	791 tons per year
CO	1,114 tons per year
VOC	162 tons per year